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**GULFCO MARINE MAINTENANCE  
BASELINE ECOLOGICAL RISK ASSESSMENT**

**96h BRINE SHRIMP ACUTE TOXICITY TESTS**  
*Artemia salina*

**URS Subcontract Number 236208.UB  
Work Order Number 237933.US**

**PBS&J Log No. 10-1110**

Prepared for:

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Houston, Texas 77042

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TCEQ Certificate No. T104704202-10-1

October 5, 2010



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## **1. Introduction**

PBS&J was subcontracted by URS Corporation (URS), in support a URS prime contract with the Dow Chemical Company, to conduct acute toxicity tests of surface water samples collected from the Gulfco Marine Maintenance NPL site, located in Brazoria County near Freeport, Texas. Data acquired through tests conducted by PBS&J will be used to support decisions required for a Baseline Ecological Risk Assessment.

The tests reported herein were added to the original work scope as a replacement for a 7-day mysid survival and growth test of surface water samples collected at the Gulfco Marine Maintenance site. Two of the samples (EWSW-01 and EWSW-04) exhibited salinity values (40.1‰ and 38.9‰, respectively) that were above the range (20‰ to 30‰) recommended for mysid chronic tests (EPA, 2002).

## **2. Methods and Materials**

An experimental 96h static, renewal toxicity test with the brine shrimp<sup>1</sup> (*Artemia salina*) was used to assess surface water toxicity.

### **2.1 Laboratory Facilities**

The toxicity tests were conducted at the PBS&J Environmental Toxicology Laboratory in Houston, Texas in temperature-controlled rooms maintained at 25±1°C. Cool-white fluorescent light fixtures positioned over benches in the testing areas provided a light intensity of 100-1000 lux (~10-100 ft-c); the photoperiod was 16L:8D hours.

### **2.2 Test Organism**

Brine shrimp, *Artemia salina*, were hatched from cysts (Aquafauna Bio-Marine, Hawthorne, CA; "Utah" strain, Lot # AAO-4050) at the PBS&J laboratory. The age of the brine shrimp at the beginning of the tests was between 24 and 48 hours post-hatch. The brine shrimp were hatched in reconstituted seawater at a salinity of ~25‰, then acclimated over the 16-20 hours to a final salinity of ~38‰. During acclimation, the salinity was gradually increased by adding small volumes high-salinity brine prepared from deionized water and a commercial aquarium sea-salt mix (HW-Marinemix).

### **2.3 Dilution Water**

Reconstituted saltwater was prepared from a commercial aquarium sea-salt mix (HW Marinemix). Make-up water was provided by a high-capacity, water purification system (activated carbon, cation exchange, anion exchange, mixed-bed resin polishing); the City of Houston municipal water supply was the ultimate water source.

### **2.4 Surface Water Samples**

The surface water samples were collected on August 30 (EWSW-01 and EWSW-04) and September 14, 2010 (EWSW-03), by Benchmark Ecological Services, Inc. personnel. The samples were placed into 20-L polyethylene cubetainers, packed (in wet ice) in insulated coolers, and transported on the same day to the PBS&J laboratory following standard chain-of custody procedures. The samples were in good condition upon arrival at the lab and showed no evidence of tampering during transit. The samples were stored until used in a darkened, walk-in cooler maintained at 1-6 °C.

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<sup>1</sup> Based on "Brine shrimp bioassay procedure for determining produced water toxicity", SPE 7129. American Institute of Mining, Metallurgical and Petroleum Engineers, Inc. 1978.

## 2.5 Sample Preparation

The salinity of Sample EWSW-03 (received at ~30‰) was increased to ~38‰ by addition of dry sea-salt. Each surface water sample was diluted, using 38‰ reconstituted seawater, to provide test concentrations of 6.25%, 12.5%, 25%, 50% and 100% (ie., undiluted surface water). The test solutions were placed in the temperature-controlled testing room and allowed to equilibrate to the test temperature.

## 2.6 Exposure Systems

The tests were conducted in 40 mL (1 oz) disposable, polystyrene cups, filled with about 30 mL of test solution.

## 2.7 Experimental Design

The tests were static renewal exposures; test solutions were renewed at the 48-hr midpoint. Five replicate cups were employed for each test concentration and control treatment; each cup was loaded with 20 or  $10^2$  test organisms. The number of surviving organisms in each test cup was determined after 24, 48, 72 hours and at the end of the test.

## 2.8 Statistical Analyses (LC50)

Where possible, a median lethal concentration (LC50) was determined using the Trimmed Spearman-Karber procedure provided by CETIS v.1.8.0.4 (Tidepool Scientific Software, McKinleyville, CA).

# 3. Results

Sample chain-of-custody documents are provided in Appendix A. Original test records, including reference toxicant test results, are given in Appendix B. Statistical analyses are presented in Appendix C.

## 3.1 Initial Water Quality Characteristics

Water quality characteristics of the Gulfco surface waters are summarized in Appendix A.

## 3.2 Acute Toxicity Tests

Results of the acute toxicity tests are summarized in Tables 1-3. Control survival in all tests failed to meet the 90% test acceptability criterion through the planned 96-hr exposure period; therefore, toxicity assessment is limited to the longest duration for which the control survival was acceptable. Because of the control failures, the data may have limited useability.

EWSW-01: Brine shrimp survival in the undiluted surface water sample was  $\geq 80\%$  for all test durations where the corresponding control response was  $\geq 90\%$ ; thus, there is no evidence that this sample exhibited acute toxicity.

EWSW-03: In two of the three test runs, brine shrimp survival in the undiluted surface water sample was  $\geq 80\%$  for all test durations where the corresponding control response was  $\geq 90\%$ . However, in the third test, a concentration-related mortality response was observed. A median lethal concentration (LC50) was determined for the first three intervals, as follows: 24h, 30.7%; 48h, 10.6%; and 72h, 6.2% EWSW-03.

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<sup>2</sup> Each surface water sample was tested three times. Twenty organisms were used for each replicate treatment group in the first test and ten organisms were used for each replicate treatment in the second and third tests.

EWSW-01: Brine shrimp survival in the undiluted surface water sample was  $\geq 80\%$  for all test durations where the corresponding control response was  $\geq 90\%$ ; thus, there is no evidence that this sample exhibited acute toxicity.

#### 4. Summary

Surface waters from Gulfco sites EWSW-01 and EWSW-04 showed no evidence of acute toxicity to the brine shrimp, *Artemia salina*. The sample collected at site EWSW-03, however, was toxic to the brine shrimp in one of the three tests performed.

#### 5. References

EPA, 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, 3<sup>rd</sup> ed. (EPA-821-R-02-014). U.S. Environmental Protection Agency, Office of Water, Washington, DC. October 2002.

SPE, 1978. Brine shrimp bioassay procedure for determining produced water toxicity, SPE 7129. American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.

Table 1. Survival of brine shrimp (*Artemia salina*) exposed to surface water from Gulfco Marine Maintenance sample station EWSW-01

Test #1	Percent Survival			
	24h	48h	72h	96h
Control	100	100	75*	3
6.25	100	100	95	10
12.5	98	98	91	11
25	96	96	95	20
50	100	100	99	43
100	97	97	97	75

Test #2	Percent Survival			
	24h	48h	72h	96h
Control	98	20*	6	4
6.25	96	52	50	44
12.5	98	50	46	44
25	98	62	50	48
50	94	58	52	52
100	96	64	60	60

Test #3	Percent Survival			
	24h	48h	72h	96h
Control	100	90	90	52*
6.25	98	86	86	58
12.5	100	86	84	80
25	98	82	82	82
50	100	96	96	90
100	100	80	80	80

\* Control failure (<90% survival)

Table 2. Survival of brine shrimp (*Artemia salina*) exposed to surface water from Gulfco Marine Maintenance sample station EWSW-03

Test #1	Percent Survival			
	24h	48h	72h	96h
Control	100	100	81*	1
6.25	100	100	96	23
12.5	100	100	100	33
25	100	100	100	52
50	98	98	98	73
100	100	100	100	94

Test #2	Percent Survival			
	24h	48h	72h	96h
Control	94	34*	24	24
6.25	96	58	54	50
12.5	86	58	48	56
25	80	48	44	44
50	82	56	54	54
100	82	18	8	8

Test #3	Percent Survival			
	24h	48h	72h	96h
Control	100	94	92	84*
6.25	100	70	46	8
12.5	84	40	4	0
25	42	10	0	0
50	44	8	0	0
100	20	0	0	0
LC50 (95% CI)	30.7 (24.1-39.1)	10.6 (8.7-13)	6.2 (5.0-7.7)	not determined

\* Control failure (<90% survival)

Table 3. Survival of brine shrimp (*Artemia salina*) exposed to surface water from Gulfco Marine Maintenance sample station EWSW-04

Test #1	Percent Survival			
	24h	48h	72h	96h
Control	99	99	89*	10
6.25	98	98	85	15
12.5	100	100	99	17
25	99	99	99	35
50	99	99	99	73
100	99	99	99	90†

† Value is the minimum survival for the test concentration (number of survivors not recorded for replicate "E")

Test #2	Percent Survival			
	24h	48h	72h	96h
Control	96	40*	32	30
6.25	92	56	48	44
12.5	82	64	58	58
25	90	62	62	56
50	84	74	70	70
100	84	64	60	60

Test #3	Percent Survival			
	24h	48h	72h	96h
Control	100	86*	74	34
6.25	100	98	96	84
12.5	100	82	82	78
25	100	90	90	76
50	100	94	94	86
100	100	96	96	92

\* Control failure (<90% survival)

## **Appendix A**

### **Sample Custody Forms**



Environmental Toxicology Laboratory  
888 West Sam Houston Parkway South  
Suite 110  
Houston, Texas 77042

Tel: (713) 977-1500  
Fax: (713) 977-9233

**Analysis Request and Chain of Custody Record**  
Please indicate type of test required

Client Name:	URS	C. dubia (Waterflea)	D. pulex (Waterflea)	P. promelas (Fathead minnow)	M. bahia (opossum shrimp)	M. beryllina (Inland silverside)			
Contact Name:	David Lingle Tel: (713) 914 6699	<input type="checkbox"/> 24 hr	<input type="checkbox"/> 24 hr	<input type="checkbox"/> 24 hr	<input type="checkbox"/> 24 hr	<input type="checkbox"/> 24 hr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P.O. Number:		<input type="checkbox"/> 48 hr	<input type="checkbox"/> 48 hr	<input type="checkbox"/> 48 hr	<input type="checkbox"/> 48 hr	<input type="checkbox"/> 48 hr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project Name:	Gulfco BERCA	<input type="checkbox"/> 7 day	<input type="checkbox"/> 7 day	<input type="checkbox"/> 7 day	<input checked="" type="checkbox"/> 7 day	<input type="checkbox"/> 7 day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PBS&J Job No:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Special Instructions/comments:

Sample Location/ID& outfall	Sample Type (Effluent, receiving water, Sediment, etc.)	Sample Date (mm/dd/yy)		Sample Time (Military)		PBS&J Use Only			
		From	To	From	To	Containers Received	Temperature	°C	Init.
1 EWSW01	water	8-30-10		1201	/	3	60L	3	HL
2 EWSW04	water	8-30-10		1335	/	3	60L	3	HL
3									
4									
5									
6									
7									

Sampled by: Neil Hentzene  
Print Name

Signature

Samples received in good condition  Yes  No

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
1 <i>Mark da</i>	8/30/10	1612	<i>John</i>	8/30/10	1612
2					
3					

PBS&J Use Only: Received at PBS&J Laboratory: 8/30/10 1612 *John* All PBS&J Std Terms and Conditions Apply



Environmental Toxicology Laboratory  
888 West Sam Houston Parkway South  
Suite 110  
Houston, Texas 77042

Tel: (713) 977-1500  
Fax: (713) 977-9233

**Analysis Request and Chain of Custody Record**  
Please indicate type of test required

Client Name:	URS					
Contact Name:	David Lingle Tel: 713 914 6699					
P.O. Number:						
Project Name:	Gulfco BERA					
PBS&J Job No:						

Special Instructions/comments:  
① Received at lab w/ice 9/14/10 - em

Please confirm test with URS

Sample Location/ID& outfall	Sample Type (Effluent, receiving water, Sediment, etc.)	Sample Date (mm/dd/yy)		Sample Time (Military)		PBS&J Use Only			
		From 9-14-10	To	From	To	Containers Received	Temperature	°C	Init.
1 EWSW03	Water	9-14-10	/	1200	/	1	20L	11°	em
2									
3									
4									
5									
6									
7									

Sampled by: Neil Hawthorne

Print Name

Signature

Samples received in good condition  Yes  No

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
1	9-14-10	1510	? Means	9-14-10	1510
2					
3					

PBS&J Use Only: Received at PBS&J Laboratory:

9/14/10 1520

? Means

All PBS&J Std Terms and Conditions Apply

CLIENTID	PARAMETER	RESULT	QUAL	UNITS	MDL	ANALYZED	COLLECTED	RECEIVED
URS-EWSW01	alkalinity	156		ppm		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	ammonia nitrogen	0.43		ppm	0.01	8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	conductivity	59600		umhos/cm		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	dissolved oxygen	5.6		mg/l		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	hardness	8600		ppm		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	pH	7.3		pH		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	salinity	40.1		ppt		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	temperature	25		Deg. C		8/30/2010 0:00	8/30/2010 12:09	8/30/2010
URS-EWSW04	total residual chlorine	0.1	U	mg/l	0.1	8/30/2010 0:00	8/30/2010 12:09	8/30/2010
	alkalinity	276		ppm		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	ammonia nitrogen	0.01	U	ppm	0.01	8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	conductivity	58300		umhos/cm		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	dissolved oxygen	6.3		mg/l		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	hardness	6800		ppm		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	pH	7.7		pH		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	salinity	38.9		ppt		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
URS-EWSW03	temperature	25		Deg. C		8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	total residual chlorine	0.1	U	mg/l	0.1	8/30/2010 0:00	8/30/2010 13:35	8/30/2010
	alkalinity	288		ppm		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	ammonia nitrogen	0.01	U	ppm	0.01	9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	conductivity	46170		umhos/cm		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	dissolved oxygen	7.9		mg/l		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	hardness	6000		ppm		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	pH	8.1		pH		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
Reviewed by:	salinity	30		ppt		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	temperature	25		Deg. C		9/14/2010 0:00	9/14/2010 12:00	9/14/2010
	total residual chlorine	0.1	U	mg/l	0.1	9/14/2010 0:00	9/14/2010 12:00	9/14/2010

Reviewed by: S. Gregory  
9/16/2010

**Appendix B**

Toxicity Test Records

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	100016848 01.W
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**96 h Acute Brine Shrimp (*Artemia* sp.) Toxicity Test Condition Summary  
Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031**

Test Organism:	Brine Shrimp ( <i>Artemia</i> sp.)	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per Replicate:	20
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	algae suspension
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00914	DOB	9/15/10
Source	PBS & J	Age (hr)	>24 hr but <48 hr old

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	08/30/10	1209
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/16/10	1530	HS / UB	72 h Counts	9/19/10	1430	DK
24 h Counts	9/17/10	1430	UB	96 h Termination	9/20/10	1330	HJ
48 h Counts	9/18/10	1500	DL			NA	NA

48-hr Feeding	Date	Time	Initials
	9-18-10	1530	DK

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

Jp Moncler  
Final review signature

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

HS / HJ  
Initial Review

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	108016848 01.II
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Acute Toxicity Test with *Brine Shrimp*

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	20	20	20	18	0	50	A	20	20	20	20	8
	B	20	20	20	13	0		B	20	20	20	20	8
	C	20	20	20	16	0		C	20	20	20	19	7
	D	20	20	20	11	0		D	20	20	20	20	6
	E	20	20	20	17	3		E	20	20	20	20	14
6	A	20	20	20	18	2	100	A	20	20	20	20	17
	B	20	20	20	20	3		B	20	17	17	17	14
	C	20	20	20	20	1		C	20	20	20	20	12
	D	20	20	20	17	0		D	20	20	20	20	16
	E	20	20	20	20	4		E	20	20	20	20	16
13	A	20	20	20	18	3		A					
	B	20	20	20	20	2		B					
	C	20	20	20	16	0		C					
	D	20	20	20	19	0		D					
	E	20	18	18	18	6		E					
25	A	20	18	18	18	2		A					
	B	20	20	20	20	3		B					
	C	20	20	20	19	4		C					
	D	20	19	19	19	3		D					
	E	20	19	19	19	4		E					

Comments:

HS / HS  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10 - 1110	PBS&J Job No.	i00016848 01.11
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0				8.0	
6	8.0				8.1	
13	7.9				8.1	
25	7.9				8.1	
50	7.7				8.1	
100	7.3				8.1	
Meter No.	765				765	
Time	1530				1430	
Initials	HJ LB				HJ	

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	24 25					25 26
6	24 25					25 26
13	24 25					25 26
25	24 25					25 26
50	24 25					25 26
100	24 25					25 26
Meter No.	781					781
Time	1530					1430
Initials	HJ LB					HJ

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	6.8				6.3	
6	6.7				6.3	
13	6.7				6.4	
25	6.6				6.4	
50	6.6				6.4	
100	6.2				6.4	
Meter No.	780				735	
Time	1530				1430	
Initials	HJ LB				HJ	

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	44
6	38	43
13	38	42
25	38	43
50	39	43
100	39	44
Meter No.	755	755
Time	1530	1430
Initials	HJ LB	HJ

Comments:

HJ / HJ

Initial Review

Page 3 of 3

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

061965

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	100016848
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96 h Acute Brine Shrimp ( <i>Artemia sp.</i> ) Toxicity Test Condition Summary Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031			
Test Organism:	Brine Shrimp ( <i>Artemia sp.</i> )	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per	10
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	<i>Isochrysis algae</i>
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00938	DOB	>24 h but ≤ 48 h old
Source	PBSJ	Age (hr)	>24 h but ≤ 48 h old

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
-------------------------	-----------------------------	-------------------	-----

Sample 1 Date/Time	08/30/10	1209
--------------------	----------	------

Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/21/10	1530	HB/SK	72 h Counts	9/24/10	1430	SK
24 h Counts	9/22/10	1430	SK	96 h Termination	9/25/10	1430	SK
48 h Counts	9/23/10	1400	HS		NA	NA	NA

48-hr Feeding	Date	Time	Initials
	09/23/10	1330	HS

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments: ①IE HS 9/23/10 → [9/20/10]

Jo Mondie  
Final review signature

HS / DL  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	100016848
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Acute Toxicity Test with *Brine Shrimp*

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	10	10	1	0	0	50	A	10	10	9	8	6
	B	10	10	2	1	0		B	10	9	5	4	4
	C	10	9	1	0	0		C	10	9	5	5	5
	D	10	10	2	0	0		D	10	9	5	5	5
	E	10	10	3	2	2		E	10	10	5	4	4
6	A	10	10	4	4	4	100	A	10	10	6	6	6
	B	10	8	3	3	3		B	10	10	7	7	7
	C	10	10	8	8	7		C	10	9	7	7	7
	D	10	10	4	3	2		D	10	9	6	5	5
	E	10	9	7	7	6		E	10	10	6	5	5
13	A	10	10	5	5	5		A					
	B	10	9	4	3	3		B					
	C	10	10	3	3	3		C					
	D	10	10	6	5	4		D					
	E	10	10	7	7	7		E					
25	A	10	10	6	6	6		A					
	B	10	10	7	7	6		B					
	C	10	9	4	4	4		C					
	D	10	10	5	5	5		D					
	E	10	10	4	3	3		E					

Comments:

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HJ / DL  
Initial Review

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	100016848
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0				8.1	
6	8.0				8.1	
13	8.0				8.1	
25	7.9				8.1	
50	7.8				8.1	
100	7.4				8.2	
Meter No.	765				742	
Time	1530				1500	
Initials	HJLB				SK	

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	24	25				25
6	24	25				25
13	24	25				25
25	24	25				25
50	24	25				25
100	24	25				25
Therm. No.	T81					T74
Time	1530					1500
Initials	HJLB					SK

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	6.9				6.4	
6	6.9				6.5	
13	6.9				6.5	
25	6.9				6.5	
50	6.9				6.6	
100	7.0				6.6	
Meter No.	735	-			780	
Time	1530				1500	
Initials	HJLB				SK	

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	46
6	38	45
13	38	45
25	38	45
50	39	45
100	39	45
Meter No.	755	749
Time	1530	1500
Initials	HJ LB	SK

Comments:

HJ / D/L

Initial Review

Page 3 of 3

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

061968

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	100016848
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96 h Acute Brine Shrimp ( <i>Artemia sp.</i> ) Toxicity Test Condition Summary Test Method EPA/600/4-90/027F; PBS&J SOP No. 4031			
Test Organism:	<i>Brine Shrimp</i> ( <i>Artemia sp.</i> )	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per	10
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	<i>Isochrysis algae</i>
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00956	DOB	9.28.10
Source	PBS&J	Age (hr)	>24 hr but <48 hr

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	08/30/10	1209
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/29/10	1330	HS/SK	72 h Counts	10/2/10	1300	DL
24 h Counts	9/30/10	1430	HS	96 h Termination	10/3/10	1300	DL
48 h Counts	10/1/10	1430	HS		NA	NA	NA

48-hr Feeding	Date	Time	Initials
	10-1-10	1300	TL

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

Final review signature

Data correction codes: IE-incorrect entry; WC-wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

Initial Review

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 01)	Login No.	10-1110	PBS&J Job No.	100016848
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Acute Toxicity Test with *Brine Shrimp*

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	10	10	9	9	6	50	A	10	10	9	9	9
	B	10	10	9	9	4		B	10	10	10	10	10
	C	10	10	9	9	5		C	10	10	9	9	7
	D	10	10	8	8	3		D	10	10	10	10	10
	E	10	10	10	10	8		E	10	10	10	10	9
6	A	10	10	8	8	6	100	A	10	10	9	9	9
	B	10	10	9	9	8		B	10	10	6	6	6
	C	10	10	10	10	7		C	10	10	7	7	7
	D	10	10	9	9	5		D	10	10	8	8	8
	E	10	9	7	7	3		E	10	10	10	10	10
13	A	10	10	10	9	9		A					
	B	10	10	10	10	9		B					
	C	10	10	7	7	7		C					
	D	10	10	8	8	8		D					
	E	10	10	8	8	7		E					
25	A	10	10	8	8	8		A					
	B	10	10	8	8	8		B					
	C	10	10	9	9	9		C					
	D	10	9	8	8	8		D					
	E	10	10	8	8	8		E					

Comments:

H5/DL  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 01)	Login No.	iB-1110	PBS&J Job No.	100016848
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0					8.1
6	7.9					8.1
13	7.9					8.1
25	7.9					8.1
50	7.7					8.1
100	7.4					8.1
Meter No.	765					765
Time	1300					1330
Initials	HJSK					LS DL

Conc. (%)	Temperature °C (Actual/Corrected)						
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr	
Rep	A	B	C	Comp	D	E	
Cont.	19	20				19	20
6	19	20				19	20
13	19	20				19	20
25	19	20				19	20
50	19	20				19	20
100	19	20				19	20
Meter No.	T-81					T-81	
Time	1300					1330	
Initials	HJSK					LS DL	

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	7.2					9.0
6	7.2					7.9
13	7.2					7.9
25	7.2					7.8
50	7.2					7.8
100	7.2					7.8
Meter No.	7.2					7.35
Time	1300					1330
Initials	HJSK					LS DL

Comments: ① IESK 9/29/10 → [735]

② 1300 → [1330]

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	38
6	38	38
13	38	38
25	38	38
50	39	39
100	39	39
Meter No.	755	755
Time	1300	1330
Initials	HJSK	LS DL

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HS / DL

Initial Review

Page 3 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016848 OL.W
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**96 h Acute Brine Shrimp (Artemia sp.) Toxicity Test Condition Summary**  
**Test Method EPA/600/4-90/ 027F; PBS&J SOP No. 4031**

Test Organism:	Brine Shrimp (Artemia sp.)	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per Replicate:	20
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	algae suspension
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00914	DOB	9/15/10
Source	PBS&J	Age (hr)	>24 hr but <48 hr old

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	09/14/10	1200
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/16/10	1530	LB/HJ	72 h Counts	9/19/10	1500	DK
24 h Counts	09/17/10	1500	HJ	96 h Termination	9/20/10	1400	HJ
48 h Counts	9/18/10	1530	DK		NA	NA	NA

48-hr Feeding	Date	Time	Initials
	9/18/10	1530	DK

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

J. Mondie  
Final review signature

HJ / HJ

Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016348 01.W
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Acute Toxicity Test with *Brine Shrimp*

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	20	20	20	17	0	50	A	20	20	20	20	18
	B	20	20	20	13	0		B	20	20	20	20	16
	C	20	20	20	16	0		C	20	20	20	20	15
	D	20	20	20	17	1		D	20	18	18	18	15
	E	20	20	20	18	0		E	20	20	20	20	19
6	A	20	20	20	19	4	100	A	20	20	20	20	18
	B	20	20	20	20	3		B	20	20	20	20	20
	C	20	20	20	20	4		C	20	20	20	20	20
	D	20	20	20	20	4		D	20	20	20	20	19
	E	20	20	20	19	8		E	20	20	20	20	17
13	A	20	20	20	20	7		A					
	B	20	20	20	20	7		B					
	C	20	20	20	20	8		C					
	D	20	20	20	20	3		D					
	E	20	20	20	20	8		E					
25	A	20	20	20	20	10		A					
	B	20	20	20	20	8		B					
	C	20	20	20	20	12		C					
	D	20	20	20	20	11		D					
	E	20	20	20	20	11		E					

Comments:

HJS / HJS  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016348 cl.u
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0				8.0	
6	8.0				8.0	
13	8.0				8.1	
25	7.9				8.1	
50	7.9				8.2	
100	7.9				8.2	
Meter No.	765				765	
Time	1530				1430	
Initials	HJ LB				HJS	

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	6.8				6.3	
6	6.6				6.3	
13	6.6				6.3	
25	6.6				6.4	
50	6.7				6.4	
100	6.7				6.4	
Meter No.	780				735	
Time	1530				1430	
Initials	HJ LB				HJS	

Comments:

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	24	25				25-26
6	24	25				25-26
13	24	25				25-26
25	24	25				25-26
50	24	25				25-26
100	24	25				25-26
Meter No.	781					781
Time	1530					1430
Initials	HJ LB					HJS

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	44
6	38	42
13	38	42
25	38	42
50	38	43
100	38	45
Meter No.	755	755
Time	1530	1430
Initials	HJ LB	HJS

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HJ / HJS  
Initial Review  
Page 3 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016848
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96 h Acute Brine Shrimp (*Artemia sp.*) Toxicity Test Condition Summary  
Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031

Test Organism:	Brine Shrimp ( <i>Artemia sp.</i> )	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per	10
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	<i>Isochrysis algae</i>
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00938	DOB	9/20/10
Source	PBSS	Age (hr)	>24 h but < 48 h old

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	09/14/10	1200
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/21/10	1530	HS / SK	72 h Counts	9/24/10	1430	SK
24 h Counts	9/22/10	1600	HS	96 h Termination	9/25/10	1430	SK
48 h Counts	9/23/10	1430	HS		NA	NA	NA

48-hr Feeding	Date	Time	Initials
	09/23/10	1330	HS

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

Joe Mondaw  
Final review signature

HS / HLC  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016848
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Acute Toxicity Test with Brine Shrimp

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	10	9	3	2	2	50	A	10	7	5	5	5
	B	10	9	4	4	4		B	10	8	2	2	2
	C	10	10	4	0	0		C	10	9	8	8	8
	D	10	9	3	3	3		D	10	10	7	6	6
	E	10	10	3	3	3		E	10	7	6	6	6
6	A	10	9	5	4	4	100	A	10	8	1	1	1
	B	10	10	6	5	4		B	10	7	0	0	0
	C	10	9	4	4	4		C	10	8	2	2	2
	D	10	10	8	8	8		D	10	10	3	1	1
	E	10	10	6	6	5		E	10	8	3	0	0
13	A	10	8	6	5	5		A					
	B	10	10	7	6	6		B					
	C	10	10	6	6	5		C					
	D	10	7	3	2	2		D					
	E	10	8	5	5	5		E					
25	A	10	7	4	4	4		A					
	B	10	8	4	3	3		B					
	C	10	8	4	4	9		C					
	D	10	7	6	5	5		D					
	E	10	10	6	6	6		E					

Comments:

HS / ML  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-111D	PBS&J Job No.	100016848
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0					8.1
6	8.0					8.2
13	8.0					8.2
25	8.0					8.2
50	7.9					8.3
100	7.9					8.4
Meter No.	765					742
Time	1530					1500
Initials	HJ LB					SK

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	24	25				25 25
6	24	25				25 25
13	24	25				25 25
25	24	25				25 25
50	24	25				25 25
100	24	25				25 25
Meter No.	T81					T-74
Time	1530					1500
Initials	HJ LB					SK

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	6.9					6.7
6	6.9					6.7
13	6.9					6.7
25	6.9					6.7
50	6.9					6.7
100	7.0					6.6
Meter No.	735					780
Time	1530					1500
Initials	HJ LB					SK

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	47
6	38	43
13	38	44
25	38	45
50	38	45
100	38	46
Meter No.	755	749
Time	1530	1500
Initials	HJ LB	SK

Comments:

HJ / DL

Initial Review

Page 3 of 3

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

061977

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016848
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**96 h Acute Brine Shrimp (*Artemia sp.*) Toxicity Test Condition Summary  
Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031**

Test Organism:	Brine Shrimp ( <i>Artemia sp.</i> )	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per	10
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	<i>Isochrysis algae</i>
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00956	DOB	9.28.10
Source	PBS+J	Age (hr)	>24 h but < 48 hr

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	09/14/10	1200
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/29/10	1400	HS/SK	72 h Counts	10/2/10	1400	DL
24 h Counts	9/30/10	1430	HS	96 h Termination	10/3/10	1330	DL
48 h Counts	10/01/10	1500	HS			NA	NA

48-hr Feeding	Date	Time	Initials
	10-1-10	1300	RL

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

Joe Mondie  
Final review signature

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HS / DL  
Initial Review

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016848
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Acute Toxicity Test with Brine Shrimp

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	10	10	9	9	9	50	A	10	2	0	0	0
	B	10	10	9	8	7		B	10	7	1	0	0
	C	10	10	10	10	9		C	10	5	1	0	0
	D	10	10	10	10	8		D	10	3	1	0	0
	E	10	10	9	9	9		E	10	5	1	0	0
6	A	10	10	8	4	0	100	A	10	4	0	0	0
	B	10	10	8	6	1		B	10	2	0	0	0
	C	10	10	8	5	0		C	10	2	0	0	0
	D	10	10	6	5	2		D	10	1	0	0	0
	E	10	10	5	3	1		E	10	1	0	0	0
13	A	10	10	6	1	0		A					
	B	10	10	6	0	0		B					
	C	10	8	3	0	0		C					
	D	10	6	2	1	0		D					
	E	10	8	3	0	0		E					
25	A	10	3	0	0	0		A					
	B	10	5	4	0	0		B					
	C	10	5	0	0	0		C					
	D	10	2	0	0	0		D					
	E	10	6	1	0	0		E					

Comments:

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HS/WL  
Initial Review

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 03)	Login No.	10-1110	PBS&J Job No.	100016848
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0					8.1
6	8.0					8.1
13	7.9					8.1
25	7.9					8.2
50	7.8					8.2
100	7.8					8.2
Meter No.	765					765
Time	1300					1330
Initials	HJS/K					LS/DK

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	19	20				19 20
6	19	20				19 20
13	19	20				19 20
25	19	20				19 20
50	19	20				19 20
100	19	20				19 20
Meter No.	T81					T81
Time	1300					1330
Initials	HJS/K					LS/DK

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	7.2					7.7
6	7.2					7.8
13	7.2					7.8
25	7.2					7.8
50	7.2					7.8
100	7.2					7.9
Meter No.	735					735
Time	1300					1330
Initials	HJS/K					LS/DK

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	38
6	38	38
13	38	38
25	38	38
50	38	38
100	39	37
Meter No.	755	755
Time	1300	1330
Initials	HJS/K	LS/DK

Comments:

HJS/DK  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

Page 3 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	i000ib848 01.u
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96 h Acute Brine Shrimp (Artemia sp.) Toxicity Test Condition Summary Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031			
Test Organism:	Brine Shrimp (Artemia sp.)	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per Replicate:	20
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	algae suspension
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00914	DOB	9/15/10
Source	PBS&J	Age (hr)	>24 hr but <48 hr old

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	08/30/10	1335
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/16/10	1530	HJ/SK	72 h Counts	9/19/10	1530	DIC
24 h Counts	9/17/10	1530	HJ/LB	96 h Termination	9/20/10	1430	HJ
48 h Counts	9/18/10	1600	DK		NA	NA	NA

48-hr Feeding	Date	Time	Initials
	9/18/10	1530	DK

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

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Final review signature

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HJ / HJ  
Initial Review

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	100016848 A1.W
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Acute Toxicity Test with Brine Shrimp

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	20	20	20	20	3	50	A	20	19	19	19	16
	B	20	19	19	19	3		B	20	20	20	20	16
	C	20	20	20	17	1		C	20	20	20	20	9
	D	20	20	20	18	0		D	20	20	20	20	14
	E	20	20	20	18	2		E	20	20	20	20	18
6	A	20	20	20	19	5	100	A	20	19	19	19	19
	B	20	20	20	16	2		B	20	20	20	20	19
	C	20	20	20	18	1		C	20	20	20	20	18
	D	20	18	18	15	2		D	20	20	20	20	16
	E	20	20	20	17	5		E	20	20	20	20	
13	A	20	20	20	20	6		A					
	B	20	20	20	20	1		B					
	C	20	20	20	19	1		C					
	D	20	20	20	20	2		D					
	E	20	20	20	20	7		E					
25	A	20	20	20	20	10		A					
	B	20	20	20	20	7		B					
	C	20	20	20	20	6		C					
	D	20	19	19	19	5		D					
	E	20	20	20	20	7		E					

Comments:

① IE YK 9/19/10 → [15]

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HS / HS  
Initial Review

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	i0-111D	PBS&J Job No.	i00516848 01.u
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0					8.0
6	8.0					8.0
13	8.0					8.1
25	7.9					8.1
50	7.9					8.1
100	7.7					8.2
Meter No.	765					765
Time	1530					1430
Initials	HJS LB					HJS

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	6.8					6.3
6	6.6					6.3
13	6.6					6.4
25	6.6					6.4
50	6.7					6.4
100	6.7					6.4
Meter No.	780					735
Time	1530					1430
Initials	HJS LB					HJS

Comments: ①IE HJS 9/20/10 - 5[45]

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	24 25					25 24
6	24 25					25 26
13	24 25					25 26
25	24 25					25 26
50	24 25					25 26
100	24 25					25 26
Therm. No.	T81					T81
Time	1530					1430
Initials	HJS LB					HJS

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	47 ①
6	38	44
13	38	43
25	38	44
50	38	44
100	38	45
Meter No.	755	755
Time	1530	1430
Initials	HJS LB	HJS

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HJS / HJS  
Initial Review

Page 3 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	ID-1110	PBS&J Job No.	100016848
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**96 h Acute Brine Shrimp (*Artemia sp.*) Toxicity Test Condition Summary**  
**Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031**

Test Organism:	Brine Shrimp ( <i>Artemia sp.</i> )	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per	10
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	<i>Isochrysis algae</i>
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00938	DOB	>24 h but <48 h old
Source	Pass	Age (hr)	>24 h but <48 h old

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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Sample 1 Date/Time	08/30/10	1335
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/21/10	1530	HJS / UJS	72 h Counts	9/24/10	1500	SK
24 h Counts	9/22/10	1630	HJS	96 h Termination	9/25/10	1430	SK
48 h Counts	9/23/10	1430	HJS		NA	NA	NA

48-hr Feeding	Date	Time	Initials
	09/23/10	1330	HJS

This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments: *① IE HJS 9/23/10 → [9/20/10]*

*J. Mondie*  
Final review signature

*HJS / DL*  
Initial Review

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	100016848
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Acute Toxicity Test with Brine Shrimp

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	10	9	4	4	4	50	A	10	9	9	8	8
	B	10	9	4	3	3		B	10	9	8	8	8
	C	10	10	4	3	3		C	10	7	5	5	5
	D	10	10	3	1	1		D	10	8	8	8	8
	E	10	10	5	5	4		E	10	9	7	6	6
6	A	10	9	7	7	6	100	A	10	10	6	6	6
	B	10	10	4	3	2		B	10	9	7	6	6
	C	10	9	5	4	4		C	10	9	7	6	6
	D	10	9	6	4	4		D	10	6	5	5	5
	E	10	9	6	6	6		E	10	8	7	7	7
13	A	10	8	5	5	5		A					
	B	10	8	8	8	8		B					
	C	10	9	8	7	7		C					
	D	10	7	4	3	3		D					
	E	10	9	7	6	6		E					
25	A	10	8	7	7	6		A					
	B	10	10	4	4	4		B					
	C	10	9	7	7	6		C					
	D	10	9	7	7	6		D					
	E	10	9	6	6	6		E					

Comments:

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

HS / DL  
Initial Review

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	100016848
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	8.0					8.0
6	8.0					8.1
13	8.0					8.1
25	7.9					8.2
50	7.9					8.3
100	7.8					8.4
Meter No.	765					742
Time	785					1500
Initials	HJ LB					SK

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	24	25				25
6	24	25				25
13	24	25				25
25	24	25				25
50	24	25				25
100	24	25				25
Meter No.	T81					T-74
Time	1530					1500
Initials	HJ LB					SK

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	6.9					6.9
6	6.9					7.0
13	6.9					7.0
25	6.9					6.9
50	6.9					6.9
100	6.9					6.8
Meter No.	735					735
Time	1530					1500
Initials	HJ LB					SK

Comments: (HJ LB 9/21/10 → 1530)

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	50
6	38	45
13	38	46
25	38	46
50	38	46
100	38	49
Meter No.	755	749
Time	1530	1500
Initials	HJ LB	SK

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

HJ / SK  
Initial Review

Page 3 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	100016848
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**96 h Acute Brine Shrimp (*Artemia sp.*) Toxicity Test Condition Summary**  
**Test Method EPA/ 600/4-90/ 027F; PBS&J SOP No. 4031**

Test Organism:	Brine Shrimp ( <i>Artemia sp.</i> )	Age Class:	> 24 hr but < 48 hr old
Test Type:	Acute Static	Test Duration:	96 h
Temperature:	25 ± 1	Photoperiod:	16:8 h; ambient light; 50-100 ft-c
Test Chamber size:	40 mL cups	Cleaning:	None
No. of Replicates:	5	No. organisms per	10
Test Solution Volume	30 mL (minimum)	Dilution Water:	Lab water
Renewal of test solution:	None	Aeration:	None
Feeding:	at 48 hr	Food Type:	<i>Isochrysis algae</i>
Acceptability Criteria	≥ 90% survival in control	Sample Holding Time Requirements:	N/A

Test Organism Batch #	10-00956	DOB	9.28.10
Source	PBS&J	Age (hr)	>24 h but < 48 h

Test Concentrations (%)	Control, 6, 13, 25, 50, 100	Critical Dilution	100
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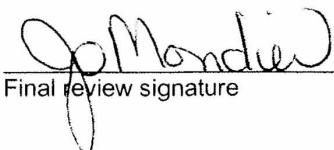
Sample 1 Date/Time	08/30/10	1335
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Hour	Date	Time	Initials	Hour	Date	Time	Initials
0 h Initiation	9/29/10	1430	HS / SK	72 h Counts	10/2/10	1330	DK
24 h Counts	9/30/10	1500	HS	96 h Termination	10/3/10	1330	LS
48 h Counts	10/1/10	1530	HS			NA	NA

48-hr Feeding	Date	Time	Initials
	10-1-10	1330	TH

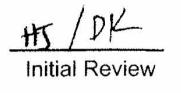
This test was conducted in accordance with the method standards or according to the exception(s) as noted:

Comments:

  
Final review signature

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

  
Initial Review

Page 1 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	100016848
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Acute Toxicity Test with Brine Shrimp

Conc. (%)	Rep.	No. of Surviving Organisms					Conc. (%)	Rep.	No. of Surviving Organisms				
		0 hr	24 hr	48 hr	72 hr	96 hr			0 hr	24 hr	48 hr	72 hr	96 hr
Control	A	10	10	10	20	1	50	A	10	10	10	10	9
	B	10	10	10	8	2		B	10	10	9	9	7
	C	10	10	7	7	3		C	10	10	10	10	9
	D	10	10	6	6	2		D	10	10	8	8	8
	E	10	10	10	9	9		E	10	10	10	10	10
6	A	10	10	10	10	10	100	A	10	10	9	9	9
	B	10	10	9	9	8		B	10	10	10	10	10
	C	10	10	10	10	10		C	10	10	10	10	8
	D	10	10	10	9	7		D	10	10	10	10	10
	E	10	10	10	10	7		E	10	10	9	9	9
13	A	10	10	3	8	8		A					
	B	10	10	6	6	5		B					
	C	10	10	10	10	9		C					
	D	10	10	3	8	8		D					
	E	10	10	9	9	9		E					
25	A	10	10	9	9	8		A					
	B	10	10	8	8	7		B					
	C	10	10	10	10	9		C					
	D	10	10	8	8	7		D					
	E	10	10	10	10	7		E					

Comments:

0 SE N/L 10/2/10 → [7]

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; OVN-organism not visible

TX - 96h Brine Shrimp

HS/DK  
Initial Review

Page 2 of 3

Client	URS - Gulfco BERA (EWSW 04)	Login No.	10-1110	PBS&J Job No.	100016848
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Water Quality Parameters - Brine Shrimp

Conc. (%)	pH					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	80					8.0
6	80					8.0
13	7.9					8.1
25	7.9					8.1
50	7.8					8.2
100	7.7					8.2
Meter No.	765					765
Time	1300					1330
Initials	HJSK					LS DLK

Conc. (%)	Temperature °C (Actual/Corrected)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	19 20					19 20
6	19 20					19 20
13	19 20					19 20
25	19 20					19 20
50	19 20					19 20
100	19 20					19 20
Therm. No.	T-81					T31
Time	1300					1330
Initials	HJSK					LS DLK

Conc. (%)	Dissolved Oxygen (mg/L)					
	0 hr	24 hr	48 hr Old	48 hr New	72 hr	96 hr
Rep	A	B	C	Comp	D	E
Cont.	7.2					9.8
6	7.1					8.8
13	7.1					8.8
25	7.2					8.7
50	7.2					8.7
100	7.2					8.8
Meter No.	735					735
Time	1300					1330
Initials	HJSK					LS DLK

Comments: 0 IE DLK 10/3/10 → 
$$\begin{bmatrix} 7.7 \\ 7.8 \\ 7.8 \\ 7.8 \\ 7.8 \\ 7.8 \end{bmatrix}$$

Conc. (%)	Salinity	
	0 hr	96 hr
Rep	A	Comp
Cont.	38	38
6	38	38
13	38	38
25	38	36
50	38	38
100	38	38
Meter No.	755	755
Time	1300	1330
Initials	HJSK	LS DLK

Data correction codes: IE-incorrect entry; WC- wrong column; WR-wrong row; TN-transposed number; ONV-organism not visible

TX - 96h Brine Shrimp

HJS / DLK  
Initial Review

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## **Appendix C**

### **Statistical Analyses**

# CETIS Analytical Report

Report Date: 05 Oct-10 17:35 (p 1 of 3)  
 Test Code: 7937F880 | 20-3371-1232

Artemia 96-h Acute Toxicity Test		PBS&J Environmental Toxicology Laboratory													
Analysis ID:	03-0580-8707	Endpoint: 24h Survival Rate		CETIS Version: CETISv1.8.0											
Analyzed:	03 Oct-10 15:37	Analysis: Trimmed Spearman-Kärber		Official Results: Yes											
Batch ID:	09-9853-6186	Test Type: Survival (96h)		Analyst:											
Start Date:	29 Sep-10 14:00	Protocol: EPA/821/R-02-014 (2002)		Diluent: Laboratory Seawater											
Ending Date:	03 Oct-10 13:30	Species: Artemia salina		Brine: HW-Marinemix											
Duration:	95h	Source: PBS&J		Age:											
Sample ID:	15-3538-8337	Code: 5B842AB1		Client: URS Corp											
Sample Date:	14 Sep-10 12:00	Material: Surface Water		Project: 100016848											
Receive Date:	14 Sep-10 15:20	Source: Gulfco Marine - BERA													
Sample Age:	15d 2h	Station: EWSW-03													
Batch Note: 3rd Run															
<b>Trimmed Spearman-Kärber Estimates</b>															
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL								
Control Threshold	0	20.00%	1.487	0.05263	30.71	24.1	39.13								
<b>Residual Analysis</b>															
Attribute	Method	Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )										
Control Trend	Mann-Kendall Trend	10		1.0000	Non-significant Trend in Controls										
<b>24h Survival Rate Summary</b>															
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B				
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	50	50				
6.25		5	1	1	1	0	0	0.0%	0.0%	50	50				
12.5		5	0.84	0.6	1	0.07483	0.1673	19.92%	16.0%	42	50				
25		5	0.42	0.2	0.6	0.07348	0.1643	39.12%	58.0%	21	50				
50		5	0.44	0.2	0.7	0.08718	0.1949	44.3%	56.0%	22	50				
100		5	0.2	0.1	0.4	0.05477	0.1225	61.24%	80.0%	10	50				
<b>24h Survival Rate Detail</b>								Calculated Variate(A/B)							
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5									
0	Negative Control	1	1	1	1	1									
6.25		1	1	1	1	1									
12.5		1	1	0.8	0.6	0.8									
25		0.3	0.5	0.5	0.2	0.6									
50		0.2	0.7	0.5	0.3	0.5									
100		0.4	0.2	0.2	0.1	0.1									
<b>Graphics</b>															

# CETIS Analytical Report

Report Date: 05 Oct-10 17:35 (p 2 of 3)  
 Test Code: 7937F880 | 20-3371-1232

Artemia 96-h Acute Toxicity Test		PBS&J Environmental Toxicology Laboratory									
Analysis ID:	03-1338-8588	Endpoint:	48h Survival Rate		CETIS Version:	CETISv1.8.0					
Analyzed:	03 Oct-10 15:37	Analysis:	Trimmed Spearman-Kärber		Official Results:	Yes					
Batch ID:	09-9853-6186	Test Type:	Survival (96h)		Analyst:						
Start Date:	29 Sep-10 14:00	Protocol:	EPA/821/R-02-014 (2002)		Diluent:	Laboratory Seawater					
Ending Date:	03 Oct-10 13:30	Species:	Artemia salina		Brine:	HW-Marinemix					
Duration:	95h	Source:	PBS&J		Age:						
Sample ID:	15-3538-8337	Code:	5B842AB1		Client:	URS Corp					
Sample Date:	14 Sep-10 12:00	Material:	Surface Water		Project:	100016848					
Receive Date:	14 Sep-10 15:20	Source:	Gulfco Marine - BERA		Station:	EWSW-03					
Sample Age:	15d 2h	Station:			Batch Note:	3rd Run					
<b>Trimmed Spearman-Kärber Estimates</b>											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.06	25.53%	1.027	0.04293	10.63	8.726	12.96				
<b>Residual Analysis</b>											
Attribute	Method	Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )						
Control Trend	Mann-Kendall Trend	6		0.4034	Non-significant Trend in Controls						
<b>48h Survival Rate Summary</b>											
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.94	0.9	1	0.02449	0.05477	5.83%	0.0%	47	50
6.25		5	0.7	0.5	0.8	0.06325	0.1414	20.2%	25.53%	35	50
12.5		5	0.4	0.2	0.6	0.08367	0.1871	46.77%	57.45%	20	50
25		5	0.1	0	0.4	0.07746	0.1732	173.2%	89.36%	5	50
50		5	0.08	0	0.1	0.02	0.04472	55.9%	91.49%	4	50
100		5	0	0	0	0	0	100.0%	0		50
<b>48h Survival Rate Detail</b>								Calculated Variate(A/B)			
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Negative Control	0.9	0.9	1	1	0.9					
6.25		0.8	0.8	0.8	0.6	0.5					
12.5		0.6	0.6	0.3	0.2	0.3					
25		0	0.4	0	0	0.1					
50		0	0.1	0.1	0.1	0.1					
100		0	0	0	0	0					
<b>Graphics</b>											

# CETIS Analytical Report

Report Date: 05 Oct-10 17:35 (p 3 of 3)  
 Test Code: 7937F880 | 20-3371-1232

Artemia 96-h Acute Toxicity Test		PBS&J Environmental Toxicology Laboratory									
Analysis ID:	04-7248-5157	Endpoint:	72h Survival Rate		CETIS Version:	CETISv1.8.0					
Analyzed:	03 Oct-10 15:37	Analysis:	Trimmed Spearman-Kärber				Official Results: Yes				
Batch ID:	09-9853-6186	Test Type:	Survival (96h)		Analyst:						
Start Date:	29 Sep-10 14:00	Protocol:	EPA/821/R-02-014 (2002)		Diluent:	Laboratory Seawater					
Ending Date:	03 Oct-10 13:30	Species:	Artemia salina		Brine:	HW-Marinemix					
Duration:	95h	Source:	PBS&J		Age:						
Sample ID:	15-3538-8337	Code:	5B842AB1		Client:	URS Corp					
Sample Date:	14 Sep-10 12:00	Material:	Surface Water		Project:	100016848					
Receive Date:	14 Sep-10 15:20	Source:	Gulfco Marine - BERA		Station:	EWSW-03					
Sample Age:	15d 2h	Station:			Batch Note:	3rd Run					
<b>Trimmed Spearman-Kärber Estimates</b>											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.08	50.00%	0.7959	0.04663	6.25	5.042	7.747				
<b>Residual Analysis</b>											
Attribute	Method	Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )						
Control Trend	Mann-Kendall Trend	4		0.5042	Non-significant Trend in Controls						
<b>72h Survival Rate Summary</b>				Calculated Variate(A/B)							
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.92	0.8	1	0.03742	0.08367	9.09%	0.0%	46	50
6.25		5	0.46	0.3	0.6	0.05099	0.114	24.79%	50.0%	23	50
12.5		5	0.04	0	0.1	0.02449	0.05477	136.9%	95.65%	2	50
25		5	0	0	0	0	0		100.0%	0	50
50		5	0	0	0	0	0		100.0%	0	50
100		5	0	0	0	0	0		100.0%	0	50
<b>72h Survival Rate Detail</b>											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Negative Control	0.9	0.8	1	1	0.9					
6.25		0.4	0.6	0.5	0.5	0.3					
12.5		0.1	0	0	0.1	0					
25		0	0	0	0	0					
50		0	0	0	0	0					
100		0	0	0	0	0					
<b>Graphics</b>											